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THE PROGNOSTIC VALUE OF MENTAL SYMPTOMS IN THE PSYCHOSES

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INTRODUCTION

The present study may be considered as an addition to the work reported by Moore (57) in his monograph on *The Essential Psychoses*, and consequently it utilizes the same technique and methods of analysis.

Moore's investigation involved the accumulation of various data on the psychotic symptoms of some four hundred patients. These records were compiled during the years from 1926 to 1928, with a few cases added in 1930 and 1931; they remained on file and offered a unique approach to attack the problem of prognosis. It was thought that by following up these patients, learning their present condition and correlating it with the information acquired several years ago, some new light might be thrown upon the relation of particular symptoms to recovery or non-recovery.

Earlier studies of this question have been concerned largely with the analysis of hospital statistics on entrance and discharge in terms of percentages. The correlation technique was designed to clarify the diagnosis of the various psychoses, and it was hoped that further application of the method would accomplish something in the field of prognosis.

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CHAPTER I

REVIEW OF THE LITERATURE

The various writings on prognosis in mental disorders may be divided with more or less accuracy into two classes: those which offer a general discussion of the topic based on observation, experience or previous literature, and those which furnish concrete data (whether the author's or another's) on the problem in question.

Almost every individual who has expressed himself on this subject has called attention to its difficulty and uncertainty. It is one field in which the scientific advances of recent years have reaped very little harvest. The physician of a century ago lacked much of our modern anatomical and physiological knowledge, but his prediction of probable outcome in cases of mental disease had nearly as much validity as that of today's psychiatrist, particularly in regard to the functional psychoses. Thus we find Crowther (9) writing in 1826 that patients with hereditary tendency are prone to relapse and that the proportion of recoveries among manias without apparent cause is often considerable.

Klotz (38) is the first author who contributes statistics. He gives a table of the number of admissions and cures in 17 European hospitals for varying periods; the percentages of cures run from 59 to 33, Exeter, for example, having 56.7 per cent in the years 1801-1819 and Nottingham 33 per cent for 1812-1819. He also considers prognosis from remote causes, duration of the illness, the age, sex, mortality of patients, and the significance of different physical symptoms.

Flemming's (18) "aphorisms" include statements to the effect that hereditary disposition may be the basis for fearing relapse, but not incurability; and that the younger the individual, the more favorable the prognosis.

Earle (12) furnishes a plethora of figures from 63 American and European institutions, in which 40.6 per cent of 120,796 patients were reported cured. He treats in detail the cause, form and

duration of mental disorders, and the incidence and causes of mortality.

Thurnam (87) lays down a rule which has achieved some fame among students of prognosis. He traced the history until death of 244 patients at the York Retreat and came to the following general conclusion:

"In round numbers, of ten persons attacked by insanity, five recover and five die, sooner or later, during the attack. Of the five who recover, not more than two remain well during the rest of their lives, the other three sustain subsequent attacks, during which at least two of them die."

Focke (19) appends to his article a table giving a general survey of the administration of Marburg insane asylums for the year 1845. The figures of interest to us show that 9.8 per cent (29 men and 13 women) of 427 patients were discharged as recovered, only one per cent as improved, and 6.3 per cent died.

Conolly (8) says that of 965 patients at Hanwell Asylum only 1/11 of the women and 1/16 of the men afforded promise of cure, but the cases there were mostly chronic. Excited cases are most favorable, alterations of melancholia and excitement are generally incurable, the character of delusions is important—these are a few of Conolly's observations.

Robertson's (68) paper resembles Conolly's, although his treatment is less comprehensive. He quotes some figures to show that mental disease reduces life-expectancy.

Fick (17) has put together statistics from various sources on age of patient, form of illness, etc., in relation to recovery. A selected few include 43.06 per cent recovered among 1635 patients; the percentage of recovery for the manic cases is 56.5, for the melancholic 51.6 and for the demented 16.8. The age at the time of admission was 15-19 years for 62.3 per cent.

Griesinger (27) holds that the form of insanity and the period of the disease are of primary importance as regards curability; the best prognostic sign of all is the patient's insight.

Nasse (58) believes that inequality of pupils possesses no great significance for the outcome of all forms of mental disturbance (except paralysis). However, he gives figures to show that the incidence of pupillary differences in insanity is larger than was

formerly supposed; Castiglioni found only 24.7 per cent with normal pupils in 146 mental patients, and Nasse himself only 36.2 per cent in 229.

Schlager's (76) article is a lengthy discussion of the topics to be considered in prognosis, but Krafft-Ebing (41) furnishes statistics on 292 patients (174 men, 118 women) whom he divides into three groups: *A*—cases of first attack with a history of heredity; of these 58.4 per cent of the men and 57.7 per cent of the women recovered, while 13.2 and 19.2 per cent improved. *B*—cases where the early life shows elementary psychic disturbances; of these the percentages for recovery are 16.1 and 13.2, and for improvement 23.0 and 17.8. *C*—cases where a congenital psychic disorder may be suspected, and here there were no recoveries and only 10 per cent of improvement among the men.

Krafft-Ebing also gives Jung's (*Allg. Ztschr. f. Psychiat.*, 21, S. 642) figures to show that, other things being equal, hereditary cases have as favorable a prognosis as those not hereditary. In the former class which contained 1010 cases, 45.5 per cent of the men and 46.9 per cent of the women recovered, while in the latter group of 2511 the percentage of all recoveries was 38.5

Ray (67) feels that statistics have failed to elicit much information on the prognosis of insanity and would resort to observation. He tells us that sudden attacks are more curable than slowly progressive ones, hereditary cases are more liable to recurrence, etc.

Frese (22) treats his subject under the usual headings: causes, age and history of patient, duration and course of the disorder, and clinical forms. He believes that one cannot speak with certainty about the recovery or non-recovery of patients; prognosis gains solidity if it is supported by favorable conditions, and the more numerous these are, the more probable is the happy outcome of the disorder.

Lagardelle's (42) little book is a general discussion of all forms of insanity in relation to prognosis. No precise figures are given, but the author says that general statistics show about 30 per cent of recoveries among all admissions; if those patients recognized as absolutely incurable are omitted, the percentage of recoveries rises to about 50. It is said that of every hundred recoveries, 85 have been obtained during the first year of treatment.

Jensen (35) gives some data from his institution at Allenberg to show that the probability of recovery is reduced after six months from 55.3 per cent to 48.3 per cent; after a year, to 27.7 per cent; after two years, to 11.5 per cent and after three years to 5.4 per cent. From this it is evident that new cases of mental disorder must be placed promptly under expert treatment.

According to Talcott (84), 80-90 per cent of uncomplicated cases of acute mania, puerperal mania and acute melancholia should recover permanently. Careful diagnosis insures valid prognosis, and the "signs" to be observed are heredity, age, sex, physical health, etc.

Thomson (86) would divide insanity into those cases dependent on functional disorder and those dependent on physical organic disease of the nervous system. He also treats the topics mentioned above and illustrates his remarks with cases and some statistics.

For Sankey (74), prognosis depends on diagnosis between general paralysis, which is incurable, and ordinary (all other forms) insanity, which is curable. The proportion of recoveries from the latter is 60-70 per cent.

Newington (60) believes hereditary predisposition to be the most important factor in determining the outcome of a case, and next to it he would place a group including the temperament and habits of the patient before he became insane. His treatment of the subject is illustrated with descriptions of cases.

Shaw (77) restricts himself to a consideration of homicidal and suicidal tendencies and warnings as to when they are to be expected.

Popoff (65) reports a case where lowering of the temperature as much as 3.3-3.7°C. below normal resulted in the recovery of a hypermanic patient. He apparently subscribes to the belief that a psychosis can by itself, without organic complications, alter the normal curve of temperature through the influence of the central nervous system.

Earle (13), in another exhaustive examination of statistics, compares the figures of British and American institutions. The percentages of all recoveries, based on all admissions, run from 37.95 to 27.88; for cases of duration less than 12 months the figures

are higher, 47.49 to 38.59 per cent. Earle calls attention to the fact that only in Massachusetts since 1879 and in England since 1883 has a distinction been made between individuals and cases. Cases only were reported and hence one individual may have been included several times as admitted and recovered. This is a point which should be borne in mind by all those who refer to old hospital records.

For Hansen (30), the etiology and duration of mental disorder are very important factors; hereditary predisposition is the most frequent cause, and the lapse of time reduces the percentage of recoveries from 60 in the first month to 2.5 in the second year. The course of the illness, its form, and various psychic and somatic symptoms are further points which influence prognosis.

McKenna (45) is interested in the duration and termination of cases of supposed somatic origin. Puerperal insanity shows a recovery rate of 48 per cent and a mortality of 11 per cent, respectively the highest and lowest figures given; epilepsy has the smallest per cent of recoveries (6) and the highest of deaths (42). The average mortality from all causes is 22 per cent.

Knecht (39) emphasizes the difficulty of prognosis and considers a correct diagnosis of less value than an accurate anamnesis for predicting outcome. The probable termination of the disorder in mania, melancholia, paranoia and dementia is discussed at some length, together with the significance of such factors as time and manner of onset.

Willerding (96) studied the records of all patients diagnosed as manic at Hildesheim institution from 1878 to 1890 and gives numerous statistical tables to show that about 70 per cent of all manics recovered after an average duration of one month; the younger an individual, the greater the hope of restoration; sudden cessation of excited manifestations is reason to fear a transition to periodicity or a speedy recidivism; and hereditary psychopathic defect is not regarded as an unfavorable prognostic sign.

Christian (7) offers figures on admission and recovery for the Eastern Michigan Asylum from 1878 to 1888. Of 2176 patients admitted during this period 17.3 per cent recovered without relapse, and 4.1 per cent recovered, relapsing one or more times. The low value for recoveries may be due to the fact that the age

of the patient, the character and chronicity of his disease were not considered. Over 40 per cent of acute and presumably curable cases admitted during the last year of the decade did recover.

Sutherland (83) repeats many of the usual statements on the curability and incurability of various types of insanities, stressing the need of experience and observation.

Stedman (79) thinks that prognosis should be based on time of life, physical condition, natural mental capacity, the immediate cause of the attack, early treatment and the form of insanity. He discusses the distinction between acute and chronic cases and says that it is often made too soon, thereby condemning a patient who might otherwise be cured.

Neff (59) furnishes statistics on the acute insanities admitted to the Eastern Michigan Asylum previous to November, 1897. Of 327 cases of mania 58.7 per cent recovered, 19.6 per cent improved, 5.1 per cent were unimproved and 12.9 per cent died. The figures for 800 cases of melancholia are, respectively, 35.2, 31.2, 10.1 and 14 per cent. Comparisons of an equal number of cases of mania and melancholia, with evidence of hereditary history, show no marked difference in symptoms, duration, or recovery rate.

Kraepelin's (40) percentages of the outcome in hebephrenic and catatonic dementia praecox were based on a study of 300 cases. He found that 75 per cent of the hebephrenic patients developed a profound degree of deterioration, 17 per cent showed a less advanced deterioration and 8 per cent apparently recovered. The figures for catatonic dementia praecox are respectively 59, 27 and 13 per cent. Remissions of a few hours or days are frequent in the latter disorder. In 20 per cent of all cases remissions are long enough for the patient to seem to have entirely recovered, but a relapse usually occurs within the first five years, although it may not come within fifteen years.

Raoul (66) gives the general rule enunciated by Joffroy that the two factors to be taken into account in prognosis are predisposition (hereditary or acquired) and the exciting cause: where the former is considerable the exciting cause may be slight with a serious outlook as to intellectual faculties; when the opposite is true the prognosis is more benign.

Accinelli's (1) article is apparently a translation of the work of Raoul mentioned above.

Ilberg (34) believes that the prognosis in mental disease is dependent on the most accurate diagnosis, treatment of the individual patient and removal of the injurious factors which stand in causal relationship with the disorder. Psychiatry as a science is still in its infancy and its progress is achieved through constant new collation and comparison of case histories.

Haslett (31), drawing his observations from notes made on 200 mental cases in his own general practice, discusses the importance of various kinds of hallucinations, and the pros and cons of recovery in acute delirious mania, puerperal mania, insanity of adolescence and melancholia.

Roncoroni (70) declares that psychoneuroses and paraphrenias with prevailing alteration of the emotional tone should not be confused in one aggregate with respect to prognosis; in each category there are different groups of pathological forms, where the prognosis possesses its own individual characteristics. He then indicates what outcome is to be expected in the various types of the paraphrenias and the phrenopathies.

According to Warnek (94), the number of cases of paranoia with favorable termination reported in the literature is not large; he cites several in which the outcome was favorable, but believes that recoveries are exceptions in the acute as well as the chronic form of paranoia. The prognosis of a pure case of paranoia can never be predicted with certainty.

Thomsen (85) suggests that age is of primary importance for prognosis, as are also the presence or absence of potential etiological factors and the possible existence of a disease of constitutional origin or exogenous production. Usually the less active the internal causes, especially heredity, and the more active the external causes, the more favorable the prognosis in the individual case.

Urquhart (91) presents a study of 809 persons—419 men and 390 women, of whom 45 per cent had insane heredity and 72 per cent insane plus neuropathic heredity; 24.1 per cent had suffered previous attacks; 31.4 per cent recovered, 38.9 per cent did not, 17.3 per cent died, and 12.6 per cent remained in the asylum. Of

the recoveries reported, 38 per cent were temporary and 17.2 per cent permanent. Urquhart believes that prognosis varies also with the incidence of the physical causes and concomitants of insanity, and all these elements must be taken into consideration.

Packard (62) briefly describes 15 cases to illustrate his conclusion that the feeling of unreality in cases of involution melancholia is not a fundamental symptom, nor a pathognomonic one, and not of bad prognostic significance.

Zablocka's (100) study is based on 515 cases of dementia praecox, about 60 per cent of whom were slightly demented after the first attack, 18 per cent moderately and 22 per cent severely. For men, the catatonic form of the disorder had the worst influence on outcome, hebephrenic the next and paranoid the lightest effect. Catatonia seemed more hopeful for women. Of catatonic symptoms, negativism and stereotypism exert the strongest unfavorable influence. Zablocka refers to the work of Wolfsohn (99), who found that the influence of hereditary defect has no decisive meaning for the outcome of the first attack of dementia praecox.

Dercum (11) discusses the various points which enter into the problem of prognosis—clinical form of the disorder, presence or absence of actual quantitative mental loss, fixation of symptoms, heredity, social status, etc.—and says that mental diseases are, roughly, either autogenetic or exogenetic, prognosis in the former being in general far less favorable.

Rogers' (69) paper is confined to the consideration of melancholia and mania. He reviews some earlier statistics, points out that prompt treatment is essential and warns that prognosis should always be guarded.

Laignel-Lavastine and Rosanoff (43) administered 150 gms. of glucose to patients at the Hôtel-Dieu, after having assured themselves of renal sufficiency and absence of glucose in the urine. In the larger number of cases there was a subsequent positive glycosuria, and the authors think that this points to a toxic insanity, the toxic character of which implies a benign psychosis; the absence of glycosuria has no value.

Mattauschek (46) studied 220 cases of dementia praecox in males, 72 of whom were soldiers and 148 civilians. His general figures show that 23.3 per cent of the former and 12 per cent of

the latter recovered completely or with defect. He concludes that prediction of probable outcome is rendered more favorable by lack of hereditary defect, acute onset, military occupation, and German rather than Jewish race.

Meyer (54), after reviewing the opinions and data of various authors, reports in detail on 14 cases which had already figured in two earlier works of his. Out of 46 cases with catatonic phenomena these 14 had recovered and 11 others had recovered with defect. He also gives data on a number of patients admitted to the Königsberg clinic from 1904 to 1906. Thirty-one of 170 dementia praecox subjects recovered; among these 4 men and 4 women were diagnosed as catatonic and 4 men and 19 women as hebephrenic. Some of these cases are also described and Meyer reiterates his former conclusion that the prognosis of dementia praecox is grave but by no means absolutely unfavorable.

Von Hösslin (32) reports on 228 manic-depressive patients who were already forty years old on admission. One or more attacks of mania or depression in earlier life was the record of 31.5 per cent, and 96.7 per cent of these recovered; for 63.5 per cent it was the first attack, and 74.6 per cent of these recovered. Of those cases which did not recover, 77 per cent passed from an acute manic-depressive condition to chronic incurability. The author finally concludes that the prognosis must be made with caution when the first attack of manic-depressive insanity appears after the fortieth year.

Stearns (78) was able to trace 315 cases of dementia praecox admitted to the hospital from 1901 to 1905. Of these 64.1 per cent were in insane hospitals, 23.8 per cent were dead, 2.5 per cent boarding out, 5.0 per cent at home apparently well and 4.5 per cent at home demented. His investigation seems to indicate the hopelessness of the disease, its high mortality, the probability of subsequent relapse and the danger of mistaking atypical depressions for catatonic dementia praecox.

Becker (3) discusses prognosis in the various organic and functional psychoses and finds it generally unfavorable, except in the case of disorders arising from alcohol, drugs or other intoxicating causes. He qualifies his pessimism regarding mania and melancholia, however, by restricting it to the probability of permanent cure.

Noble (61) furnishes data on 960 cases at the Kalamazoo State Hospital for the period July 1, 1910-June 30, 1912. The largest percentage (26.4) of recoveries is found among manic-depressive patients, while none of the dementia praecox cases recovered and 79.2 per cent of them were still in the hospital at the end of the two-year period. For all cases, the percentage recovered is 9.5, improved 10.2, unimproved (discharged) 7.2, dead 20.8, and hospitalized 48.9. At the end of two and one-half years total cures were 11.9 per cent of the original admissions and 2.6 per cent might recover, making a complete recovery rate of 14.5 per cent and a permanent recovery rate of 6 per cent according to Thurnam's rule.

Weygandt (95) devotes the larger portion of his article to a discussion of general paralysis; he also touches on mania and depression, the mental disorders of old age, the life-expectancy of the insane and the statistics of suicide, concluding with a few remarks on the special importance of prognosis in legal cases.

Rosanoff (71) reports on the outcome as far as known September 30, 1913, of all cases of first admission to Kings Park State Hospital for the year ending September 30, 1908. At the end of five years, one-fourth of all first admissions have died, a little over one-third have been discharged and about one-third are still in state institutions. About 20 per cent of the patients discharged into custody of self, relatives or friends have been readmitted within five years.

Karpas (36) believes that all forms of psychoses develop on inferior mental soil. Dementia praecox and paranoia are considered malign; manic-depressive insanity, simple depression and hysterical psychosis, benign. Toxic psychoses depend on control of the disturbing factors and traumatic psychoses on the nature and extent of the injuries.

Hamilton (29) reports 2 per cent of cured and 4 per cent of improved cases among patients diagnosed as dementia praecox; he believes that psychic influences rather than physiological chemistry will improve these figures.

Williams and Potter (98) subjected 200 cases of dementia praecox to a detailed study; 56 per cent of the patients were classified as deteriorated, 21 per cent as stationary and 23 per cent as re-

covered or much improved. They conclude among other things that absence of shut-in personality points to a favorable prognosis, and that reactive mood change and adequate emotional response indicate a hopeful outcome.

Unsworth (90) generalizes on the preparatory information necessary for psychiatric prognosis; he doubts the curability of the majority of cases, but admits that there are unexpected recoveries.

Fell's (16) is a short paper pointing out that patients showing the praecox type of reaction do recover, and calling for prompt treatment and removal of the exciting cause of the attack.

Gloël's (25) article is another discussion of prognosis in dementia praecox, treating in turn the various forms of the disorder and the importance of such points as age, sex, heredity, symptoms and therapy.

Rutherford (73) holds that the hereditary defect in mental disease is a physical one and hypothyroidal in nature; also that hypothyroidism, acting as hereditary predisposition, may account for the association between insanity and tuberculosis and cancer.

According to Mauz (49), Kretschmer's body types show characteristic distribution for circular insanity and schizophrenia; there is strong predominance of the asthenic-athletic over pyknic groups in schizophrenia and of pyknic over asthenic-athletic in the circular psychoses, as well as frequency of dysplastic malformations in schizophrenia and their striking lack in circular forms. Study of body constitution promises profit for clinical systematization and prognostication.

Dearborn (10) advocates the use of the short form of the Stanford-Binet scale to determine mental defect or regression. He considers each of the 35 tests in the scale in relation to its measurement of regression and adds that it has been profitably used for years at the New York Veterans' Hospital as a diagnostic and prognostic method.

Bevis (5) declares that recovery in mental illness appears to be dependent upon early recognition as a psychosis, correct diagnosis, appropriate treatment and proper aftercare. An encouraging number of all types of dementia praecox do recover, as do the toxic psychoses and involutional melancholia after correct treatment. The prognosis is almost uniformly favorable in manic-depressive insanity.

Hyslop's (33) paper is somewhat philosophical, dealing with what he terms first principles and expressing his views on intracranial pressure and venous drainage as physical factors of causation in mental disorders. He believes the developmental epochs of life to be especially important in determining outcome.

Strecker and Willey (81) studied intensively 186 schizophrenic patients, of whom 38 or 25.7 per cent recovered; the unrecovered group included improved, stationary and deteriorated cases. In only two patients did mental disorder in a parent apparently influence prognosis, but onset was abrupt in 68 per cent. Various points are considered, but the authors feel that "the state of affect probably constitutes the safest index of prognosis."

Meagher (52) approaches his subject from the viewpoint of the psychoanalyst, saying that the character of the patient must be studied and psychic symbolization understood for the purposes of prognosis. The outcome of manic-depressives is good, of chronic paranoiacs bad, and of dementia praecox patients a mooted question.

Matz (47) attempted to discover the results of hospitalization by a study of 2684 patients who had been under hospital treatment for approximately 6 years. Of all the cases, 0.6 per cent recovered, 50.6 per cent improved, 32.3 per cent were unimproved and 10.4 per cent died. So few recoveries are reported because conservative Bureau physicians called the stage of remission improvement rather than recovery. Of 803 dementia praecox patients 38 per cent improved after being in the hospital from 7 months to 4 years, while 75.2 per cent of 137 manic-depressives improved after a year or less.

Menninger-Lerchenthal (53) presents an interesting survey of the favorable influence upon mental disorders of physiological processes like menstruation, pregnancy, labor, climacteric, senium, diseases (especially infectious) of the body in general, and finally of mechanical, chemical and psychic traumas. He furnishes an exhaustive bibliography of 201 references.

From a study of 1050 schizophrenic and 420 manic-depressive cases Mauz (50) sought to establish criteria for prognosis, based upon the investigation of body constitution and knowledge of pathological phenomena. A mass of details is here collected in a

work of years, but definite conclusions are impossible because of the difficulty of the task and the insecurity of its ground. One important result is the observation that pyknic body build is a prognostically favorable sign even for schizophrenic psychoses.

Valdés Anciano (92) feels that the reluctance of relatives to disclose family histories or to allow the patient to be placed in even partial isolation makes the cure of mental disorder impossible in more than 50 per cent of cases; when these prejudices are removed, there will be many more remissions.

Vallejo Nágera (93) touches on the several etiological factors in the psychoses and the importance of heredity in the light of Mendelian theory. Prognosis is described as unfavorable in paranoia, extremely grave in dementia praecox, and relatively favorable in manic-depressive insanity.

Matz (48) attempted to predict the future rate of onset and morbidity of nervous and mental disease among war veterans by using a modification of a plan recommended by Dr. Horatio Pollock. The probability of an ex-service man's developing some form of psychotic disorder increases up to about the age of 40, after which there is a minor decline until 50, when the probability again increases.

Gordon (26) studied the blood pressure of normal and psychotic individuals after the ingestion of 200 grams of milk under identical conditions. All psychotic cases, but none of the normal, showed lowering of the blood pressure half an hour after taking the milk. There were variations in the rise of the blood pressure after its lowering, the manic cases being decidedly different from the depressives. The differences between the original reading and the terminal ascension were related to the duration of each phase of the manic-depressive psychosis: the smaller the difference the longer the manic phase lasted, and the greater the difference the longer the depressed phase lasted. This point may have some bearing on prognosis.

Lewis and Hubbard (44) observed 77 patients who at first presented classical pictures of manic-depressive insanity but later developed schizophrenic symptoms. They found such variations in their cases that they were unable to make lucid generalizations and preferred to present as much of their material as possible in

tabular form, but they say that the prognosis of the present attack is more favorable when the affective elements are notably in excess of the schizophrenic components.

Podall (64) states that the constitutional psychopath usually makes a poor social adjustment after hospitalization, while the catatonic praecox patient is likely to be more successful in his social relations than the hebephrenic. Many individuals with manic-depressive insanity are able to be employed during remissions.

Strauss (80) bases his article on Mauz' book, emphasizing the importance of his work and that of Kretschmer. Prognosis is dependent primarily on "establishing the presence of the true schizophrenic background as an index of the schizophrenic process." The favorable significance of the pyknic body type is reiterated.

Tomescu (89) presents the number of cures and ameliorations obtained in his department from 1924 to 1930 inclusive; the percentages range from 27.4 to 41.4 for recoveries, from 10.4 to 31.2 for ameliorated cases and, if the two groups are consolidated, from 48.9 to 64.6.

Fuller and Johnston (23) give data on all first admissions of manic-depressive and dementia praecox patients to New York State hospitals for three "selection periods" of two years each: 1909-1911, 1914-1916, 1919-1921. Histories were followed up to 1928, so that the periods of observation were respectively 16, 11 and 6 years. The percentages of schizophrenic patients discharged as recovered or improved for the three periods in order are 13.9, 16.9 and 18.7, while similar figures for manic-depressives are 45.5, 48.9 and 48.2.

According to Williams (97), the patient's mental stock and the stresses to which he has been subjected are factors in prognosis, but a considerable proportion of cases may be attributed to some definite cause such as syphilis or, in part, to some organic disease. Twenty-two of 50 autopsies revealed organic lesions which could account for the patient's mental condition, and it must have been influenced markedly by the findings in 20 cases.

Strecker (82) and his co-workers carefully studied 100 manic-depressive patients in the same manner as his earlier investigation

of schizophrenics. The cases were arbitrarily selected to form two groups, recovered and unrecovered, each containing 25 men and 25 women. Their observations show that the highest number of recoveries occurred when the onset came in the third life decade; that manic and mixed (agitated depressions) reactions offered a better prognosis than depression, and that the incidence of heredity was 28 per cent in the chronic and 8 per cent in the recovered group.

Forel (21) believes that prognosis is today at approximately the same stage as psychiatric diagnosis was when all mental disorders were rated *en masse* as insanity. Nevertheless after discussing various schizophrenic manifestations, he concludes that prognosis of schizophrenia can now perhaps be scientifically established, although it is subordinated to differential diagnosis pushed to the extreme limits of modern clinical and psychopathological investigation.

Mayer-Gross (51) discusses the course and outcome of schizophrenia at some length and in detail as to personality, age, symptoms, attitudes, remissions, external influences, final condition and death. He presents the results of an investigation of 328 patients 16-17 years after their admission to the Heidelberg clinic; 34 of these could not be traced, but 35 per cent of the remainder were at home, either well or improved, 22.4 per cent were unimproved and 42.5 per cent were dead. He compares his figures with those of Stearns (315 cases) and Otto-Martensen (292 cases); respectively they found the following percentages—5 and 33.7 at home well or improved, 68.6 and 28.5 unimproved, and 23.8 and 31.4 dead. The large number of fatal cases is due to the high death-rate of the War years and those following.

Farr and Howe (15) discovered no relation between religious ideas and prognosis.

Ewen's (14) article is a very brief treatment of the history of prognosis in mental disease with some general statements as to the probable outcome of the various psychoses.

Bellinger (4) presents a study of 37 cases of catatonic schizophrenia, 9 of whom were discharged after an average hospital residence of 13 months and were still adjusted to extramural conditions after 5 years. Six of the 9 apparently recovered com-

pletely, while 3 did so with some defect. Nine patients died, 2 were deported unimproved and 17 remained in the hospital. Bellinger feels these results confirm the conclusions of other investigators on the possibility of amelioration in a "considerable number" of cases of catatonic schizophrenia.

Rosenfeld (72) touches on the early stages of schizophrenia, pseudohysterical states, cases of migraine, genuine epilepsy, brain tumor, schizophrenic disturbances and manic-depressive insanity, and syphilitic conditions of the central nervous system.

Barbé (2) studied contractions of the iris in both normal and psychotic individuals and found that pathological modifications in the contractions of the iris are frequent but by no means universal in psychiatric cases; nevertheless he insists on the prognostic significance of these phenomena, since a pronounced retardation in the appearance of oscillations of the iris, or their complete absence, seems to coincide closely with a demented state either in process of evolution or acquired.

Gyárfás (28) furnishes an analysis of 11 recovered cases out of a total of 362 schizophrenics. In these 11 patients disturbances of motility played the largest part of all the symptoms studied; disturbances of the ego also appeared continually but in less severe form, and other symptoms were in general either not observed or only rarely. Gyárfás thinks that the observed process symptoms can be conceived of as subcortical on the basis of analogous neurological pictures.

Scheid (75) investigates the significance of the feeling of guilt in the prognosis of involutional psychoses. He distinguishes between primary and secondary forms of both *Ichschuld* (sense of personal guilt) and *Fremdschuld* (the feeling that others are responsible for one's misfortunes). A primary *Fremdschuld* appearing at the beginning of a psychosis implies an unfavorable course, but when it develops secondarily from a primary *Ichschuld* the prognosis is not bad if all connections with the preceding sense of personal guilt have vanished. On the other hand, a primary *Ichschuld* does not always imply a favorable outcome, since it may initiate a genuine schizophrenic process.

The foregoing survey of the literature on psychiatric prognosis is not an exhaustive one; no attempt was made to examine hospital

statistics or to abstract general texts, and some references were not available. Furthermore, the topic of the modern treatment of general paralysis and the change it has effected in the prognosis of that disease was omitted because it is not directly pertinent to our subject and also because it now constitutes a field to itself. For information on this point the reader is referred to such works as that of Brain and Strauss (6), who include a bibliography of 32 items.

Two principal observations are to be derived from a study of the literature: (1) that psychiatrists seem to be in approximate agreement on the points which should enter into a predictive opinion, and (2) that their statistics show a considerable lack of uniformity. Different methods of treatment may explain the latter fact to some extent, but it is undoubtedly due for the most part to imperfect diagnosis and confusion as to the concepts employed in describing and classifying the various psychoses.

CHAPTER II

THE DATA

As was stated in the introduction, this study is based on the records of a number of patients who had been examined from three to eight years previously; for the majority, however, the elapsed time between the examination and the follow-up in the early part of 1934 was approximately six years. The subjects had been reached through two hospitals and a clinic, with a total of 421 cases. Of these 332 were listed at one institution, 70 at the other and 19 at the clinic.

When it was decided to carry out the program here presented, the clinic patients were eliminated from the group because of the difficulty of tracing them after so long a period in a city of shifting population. The hospital from which the smaller number of patients had been taken was able to furnish accurate information as to their later condition, so that its report on recovery or non-recovery was accepted without further investigation. The larger group, however, came from a private institution and during the six years many patients had left the hospital in a more or less doubtful state. It was consequently necessary to resort to a questionnaire, and 139 letters were sent out, enclosing a form and explaining the nature and purpose of the inquiry.

The questionnaire was made as short, simple and specific as possible. A copy of it is as follows:

Name.....
Recovered entirely and went back to work?.....
Improved but was unable to resume previous work?.....
Unimproved but remained at home?.....
Now in a hospital or sanatorium?.....

Return to previous occupation was made the criterion of recovery, not only because the ability to achieve a satisfactory adjustment to working conditions and the social contacts which they involve may properly be considered an adequate guarantee of mental and emotional stability, but also because it afforded a

concrete piece of information about which there could be no ambiguity. In one or two instances where it was reported that the individual was engaged in work different from his previous occupation, accompanying letters made it clear that the change was due to the exigencies of the general financial depression and not to any defect of the person involved. (It may be interesting to note that, although the number of our recoveries is small and includes some housewives who returned to the management of their homes, only one patient was unable to find employment after his sojourn in the hospital—and this in a time of great economic pressure.)

Of the inquiries sent out 62 per cent were answered. The results of the questionnaire may be classified in the following manner.

Recovered.....	44
Improved.....	16
Unimproved.....	18
Dead.....	8
No response.....	40
Returned by Postal Authorities.....	13

A second request was sent to those who failed to answer the first, and the very few responses it elicited are included in the above figures.

The records furnished by the two hospitals are as follows:

Recovered.....	10
Improved.....	3
Unimproved.....	212
Dead.....	36
No record.....	2

Of the entire group of 347 patients about whom information was obtained 54 or 15.6 per cent recovered; 19 or 5.5 per cent improved; 230 or 66.3 per cent did not improve and 44 or 12.7 per cent died.

In calculating results the dead were omitted because in eight cases it was not known whether the individuals recovered or died insane and because of the possibility that they might have recovered had they lived longer.

The category of improvement was not used in any of the com-

putations on account of the looseness of the term; it was thought that its definition, as interpreted by various inexperienced persons, would be so vague as to invalidate any findings which might be made.

Only the recovered and the non-recovered, therefore, are included in our correlations and percentages.

The following table gives the percentages of recovery according to diagnosis.

	TOTAL NUMBER	RECOVERED	PER CENT RECOVERED
Manic-depressive insanity:			
Manic type.....	25	13	52.0
Depressed type.....	34	15	44.1
Involutional depression.....	19	3	15.8
Dementia praecox:			
Catatonic type.....	42	5	11.9
Hebephrenic type.....	19	3	15.8
Paranoid type.....	47	0	0
Other psychoses.....	98	15	15.3
	284	54	19.0

Accurate information as to the duration of the illness could be obtained for only 44 of our 54 recoveries. The average duration was 27.7 months with a standard deviation of 28.7.

Moore's technique of analyzing abnormal conditions yielded a numerical score for some of the symptoms studied, but not for all of them; consequently he was obliged to employ the tetrachoric method of correlation instead of the product moment (55), rating as present those symptoms whose value was above a certain limit. His final table of intercorrelations contained forty variables, from which he was able to determine five groups or syndromes each of them containing a general factor. It is with the importance of recovery in connection with these forty symptoms and the five syndromes derived from them that we are here concerned.

CHAPTER III

ANALYSIS OF THE DATA

1. The first step after the data had been obtained was the correlation¹ of recovery with the variables just mentioned. Since the tetrachoric technique is based on percentages, they were easily available and Table I includes the incidence of recovery for each symptom as well as the correlation.² A comparison of the two series of figures indicates the fallacies which may be inherent in any conclusions based on a study of percentages alone. They do not differ markedly for positive values of r , although there are one or two exceptions to the correspondence; for example, 24 per cent of recovery among patients who show homicidal tendencies would lead us to expect a higher correlation than .087, and likewise with 20 per cent and .090 for insane relatives. But when we observe the negative correlations it is at once apparent that our first column tells us almost nothing about the relation of our symptoms to non-recovery; this is especially true of the higher negative values, such as those of disorientation in time, hypochondriacal delusions, etc. Because the tetrachoric r is computed on the basis of all the patients involved, both those who do and those who do not manifest the particular symptom under consideration, it necessarily constitutes a more reliable measure of recovery or non-recovery.

II. After recovery had been correlated with each of the symptoms, it was next studied with regard to the five syndromes previously determined by Moore. The new arrangement is shown in

¹ Correlation may be defined as the tendency of two variables to vary together. When the variables cannot be quantitatively measured, the tetrachoric technique may be employed. For discussions of this technique, see Pearson (63), page 1 f., Kelley (37), page 253 f., and Thurstone (88). The formula for the probable error of the tetrachoric r is given by Pearson (63), page xl.

² It will be noted that the various symptoms have been arranged in descending order of prognosis for recovery, and it is suggested that by checking those symptoms observed in individual patients one may quickly obtain some idea of the probability of recovery in each case.

TABLE I

	RECOVERY	
	Per cent	r_t
Euphoria.....	53.3	+ .558 $\pm$.074
Tearful.....	35.0	+ .440 $\pm$.066
Depressed.....	32.7	+ .316 $\pm$.078
Previous attacks.....	29.1	+ .284 $\pm$.073
Suicidal.....	32.6	+ .284 $\pm$.084
Anxious.....	31.9	+ .279 $\pm$.081
Destructive.....	28.9	+ .205 $\pm$.088
Refusal of food.....	26.3	+ .165 $\pm$.082
Excited.....	24.0	+ .161 $\pm$.074
Alcoholism of parents.....	24.6	+ .153 $\pm$.084
Insane relatives.....	20.4	+ .090 $\pm$.078
Homicidal.....	23.8	+ .087 $\pm$.105
Irritable.....	18.4	- .022 $\pm$.076
Tantrums.....	21.3	- .051 $\pm$.086
Neurasthenic.....	16.4	- .072 $\pm$.084
Stereotypism of attitudes.....	15.8	- .097 $\pm$.083
Retarded.....	15.0	- .114 $\pm$.081
Visual hallucinations.....	15.8	- .124 $\pm$.075
Bizarre delusions.....	15.8	- .127 $\pm$.074
Mutism.....	13.7	- .153 $\pm$.084
Tactual hallucinations.....	13.8	- .176 $\pm$.079
Other hallucinations.....	13.8	- .183 $\pm$.079
Loss of finer sensibilities.....	11.9	- .185 $\pm$.087
Auditory hallucinations.....	15.3	- .189 $\pm$.072
Rational delusions.....	16.4	- .193 $\pm$.076
Stereotypism of actions.....	12.1	- .196 $\pm$.080
Disorientation in space.....	10.0	- .220 $\pm$.108
Giggling.....	10.2	- .228 $\pm$.087
Talking to voices.....	12.0	- .228 $\pm$.075
Perception defect.....	13.8	- .274 $\pm$.080
Negativism.....	11.2	- .300 $\pm$.071
Stereotypism of words.....	6.9	- .308 $\pm$.091
Total memory defect.....	12.3	- .312 $\pm$.079
Memory ratio defect.....	10.4	- .352 $\pm$.079
Absence of insight.....	14.1	- .378 $\pm$.071
Logical fallacies.....	9.7	- .400 $\pm$.076
Reasoning defect.....	8.1	- .468 $\pm$.072
Hypochondriacal delusions.....	5.6	- .478 $\pm$.066
Disorientation in time.....	5.5	- .486 $\pm$.065
Shut-in reaction.....	5.7	- .486 $\pm$.063

Table II, and we note here a few discrepancies in our positive and negative sign combinations which will be pointed out more clearly later on. When Moore's formula for the correlation of a specific variable with a general factor (56) is applied, we find that the group having the highest correlation with non-recovery, and there-

TABLE II

<i>Recovery: Correlation with</i>			
Mutism.....	-.153	Catatonic G	-.151
Negativism.....	-.300		
Refusal of food.....	+.165		
Stereotypism of attitudes.....	-.097		
Auditory hallucinations.....	-.189	Deluded G	-.209
Bizarre delusions.....	-.127		
Stereotypism of words.....	-.308		
Other hallucinations.....	-.183		
Disorientation in space.....	-.220		
Irritable.....	-.022	Manic G	+.085
Tantrums.....	-.051		
Destructive.....	+.205		
Euphoria.....	+.558		
Reasoning.....	-.468	Cognitive G	-.480
Perception.....	-.274		
Total memory.....	-.312		
Memory ratio.....	-.352		
Depressed.....	+.316	Con. Her. Dep. G	+.360
Anxious.....	+.279		
Tearful.....	+.440		
Previous attacks.....	+.284		
Insane relatives.....	+.090		
		Super-G	-.262

fore the poorest prognosis, is that of cognitive defect (-.480). This was to have been expected, but it must not be forgotten that Moore found cognitive defect to have very slight significance in the make-up of his super-general factor.

Next to cognitive defect in its relation to non-recovery is the

deluded and hallucinated group, with an r of $-.209$. Since the patients manifesting this syndrome fall into the accepted diagnosis of paranoid dementia praecox, we should expect a negative value here also, but it is perhaps surprising to find so little difference between it and the catatonic group ($-.151$), generally regarded as the most hopeful form of dementia praecox.

The manic group has a value very close to zero (.085), presumably because these patients may belong to either the manic-depressive or the praecox psychoses (Moore's *paranoia irritabilis*). Irritability and tantrums correlate with non-recovery while destructiveness and euphoria are related to recovery—the latter in the highest degree of any of our forty symptoms.

The constitutional hereditary depression group shows a definite relation to recovery ($+.360$), thus confirming the conclusion of psychiatric experience.

Moore's super-general factor was determined from the intercorrelations of the general factors³ in his five groups, and its association with recovery can be ascertained in the same manner as that used for the individual syndromes. We find the coefficient for the super-general factor and recovery to be $-.262$, indicating that the underlying group of causes common to both the manic-depressive and praecox psychoses itself implies an unfavorable prognosis, regardless of the particular forms which it may assume.

III. The next point of procedure was to take recovery as the criterion and find its multiple correlation⁴ with each of the five syndromes. This operation differs from the preceding, which was the correlation between recovery and the general factor underlying a syndrome; in the new process we attempt to predict recovery or non-recovery from the symptoms of the syndromes.

Table III gives the figures for the cognitive group. Here we

³ For the intercorrelation of general factors, see Moore (56), p. 23 f.

⁴ Multiple correlation has been defined by Foran (20) as "a technique of assembling a series of relationships in such a way that the greatest possible relationship will be obtained between a group of factors and a single factor or criterion." It indicates what correlation may be obtained from an assembly of variables when each variable in the group is given its most appropriate weight. For discussions of multiple correlation, see Kelley (37), page 279 f., Garrett (24) and Moore (56).

have a multiple correlation of .512⁵ with defect of reasoning contributing the largest weight. There is an interesting result, however, in the fact that defect of perception, although its correlation with recovery is negative, has a slight but positive weight in the equation. Consequently one would infer that this variable is of almost no importance as far as the group is concerned with predicting non-recovery, and in point of fact, when it is eliminated the multiple correlation coefficient is altered by less than one-thou-

TABLE III
Cognitive group

	1	2	3	4	5	6
1—Weights.....						
2—Recovery.....						
3—Reasoning.....	-.381	-.468				
4—Perception.....	+.035	-.274	+.563			
5—Total memory.....	-.067	-.312	+.495	+.375		
6—Memory ratio.....	-.205	-.352	+.358	+.339	+.338	

$$r_{2.3456} = .511646.$$

	1	2	3	4	5	
1—Weights.....						
2—Recovery.....						
3—Reasoning.....	-.365	-.468				
4—Total memory.....	-.064	-.312	+.495			
5—Memory ratio.....	-.200	-.352	+.358	+.338		

$$r_{2.345} = .511066.$$

sandth. Our weights, which indicate the relative contribution of each variable to the multiple correlation, also show that a defect in memory ratio is more significant for a poor prognosis than total memory defect.

Similar treatment of the manic group emphasizes anew the ambiguous nature of this syndrome (Table IV). Irritability and

⁵ Note that a multiple correlation can only be positive, and that the correlation of each of the elements of the syndrome with recovery is negative; therefore the multiple correlation .512 is with non-recovery.

tantrums, correlating with non-recovery, have negative weights, while the positive coefficients of destructiveness and euphoria show positive weights. The multiple correlation is .699, but it is almost entirely accounted for by euphoria, which, as previously noted, is the most significant of all our symptoms for recovery. When

TABLE IV
Manic group

	1	2	3	4	5	6
1—Weights.....						
2—Recovery.....						
3—Irritable.....	— .357	— .022				
4—Tantrums.....	— .244	— .051	+ .596			
5—Destructive.....	+ .262	+ .205	+ .492	+ .438		
6—Euphoria.....	+ .743	+ .558	+ .473	+ .392	+ .303	

$$r_{2.3456} = .699000.$$

	1	2	3	4		
1—Weights.....						
2—Recovery.....						
3—Irritable.....	+ .013	— .022				
4—Tantrums.....	— .059	— .051	+ .596			

$$r_{2.34} = .052182.$$

	1	2	3	4		
1—Weights.....						
2—Recovery.....						
3—Destructive.....	+ .040	+ .205				
4—Euphoria.....	+ .546	+ .558	+ .303			

$$r_{2.34} = .559346.$$

this syndrome is split up according to its positive and negative values, we still find destructiveness and euphoria to be important to a favorable prognosis (.559), while irritability and tantrums cancel each other and become entirely meaningless (.052).

The constitutional hereditary depression group (Table V) has

a multiple correlation with recovery of .495, but the weights reveal that anxiety, which is the variable most highly saturated with the general factor underlying the syndrome, has no significance at all when recovery is used as the criterion. This is perhaps to be explained by the fact that the anxious depressions probably include a group of involutional melancholias and that anxiety is found fairly commonly with deteriorating depressions. Furthermore it is also found in delusional conditions and all types of

TABLE V
Constitutional hereditary depression group

	1	2	3	4	5	6	7
1—Weights.....							
2—Recovery.....							
3—Anxious.....	-.061	+.279					
4—Depressed.....	+.116	+.316	+.697				
5—Tearful.....	+.382	+.440	+.552	+.475			
6—Previous attacks.....	+.193	+.284	+.221	+.288	+.176		
7—Insane relatives.....	+.024	+.090	+.195	+.187	+.081	+.127	

$$r_{2.34567} = .494660.$$

	1	2	3	4	5	6	
1—Weights.....							
2—Recovery.....							
3—Depressed.....	+.083	+.316					
4—Tearful.....	+.365	+.440	+.475				
5—Previous attacks.....	+.193	+.284	+.288	+.176			
6—Insane relatives.....	+.020	+.090	+.187	+.081	+.127		

$$r_{2.3456} = .493396.$$

delusions have a negative correlation with recovery. This is particularly true of hypochondriacal delusions ($r = -.478$), which naturally involve an element of anxiety. At any rate, the omission of anxiety from this group leaves the coefficient of multiple correlation practically unchanged.

When we turn to the deluded and hallucinated group (Table VI), we find further evidence of the fact that our symptoms are by no means related to recovery in the same manner as they are to

their underlying general factors. Bizarre delusions is the first variable to assert its anomalous character, but when it is omitted from the group auditory hallucinations also appears with a posi-

TABLE VI
Deluded group

	1	2	3	4	5	6	7
1—Weights.....							
2—Recovery.....							
3—Aud. hal.....	-.015	-.189					
4—Biz. del.....	+.158	-.127	+.686				
5—Other hal.....	-.146	-.183	+.685	+.667			
6—Ster. of words.....	-.275	-.308	+.455	+.436	+.344		
7—Dis. in space.....	-.160	-.220	+.359	+.360	+.236	+.280	

$$r_{2.34567} = .359704.$$

	1	2	3	4	5	6	
1—Weights.....							
2—Recovery.....							
3—Aud. hal.....	+.038	-.189					
4—Other hal.....	-.088	-.183	+.685				
5—Ster. of words.....	-.256	-.308	+.455	+.344			
6—Dis. in space.....	-.141	-.220	+.359	+.236	+.280		

$$r_{2.3456} = .344659.$$

	1	2	3	4	5		
1—Weights.....							
2—Recovery.....							
3—Other hal.....	-.066	-.183					
4—Ster. of words.....	-.247	-.308	+.344				
5—Dis. in space.....	-.135	-.220	+.236	+.280			

$$r_{2.345} = .343299.$$

tive weight. We are probably to understand from this that, while these two symptoms are not in themselves favorable to recovery, they nevertheless are not to be considered as lending support to a poor prognosis when taken in conjunction with the

other variables in the group. Their presence or absence makes very little difference to the multiple correlation, which varies only from .360 to .343.

In the catatonic group (Table VII), negativism and refusal of food stand out as the two significant symptoms, but in an absolutely contradictory manner, the weight of the former being negative in almost exactly the same degree as that of the latter is positive. Since refusal of food is quite frequently manifested by

TABLE VII
Catatonic group

	1	2	3	4	5	6
1—Weights.....						
2—Recovery.....						
3—Negativism.....	-.639	-.300				
4—Mutism.....	-.069	-.153	+.774			
5—Refusal of food.....	+.627	+.165	+.668	+.639		
6—Ster. of attitudes.....	-.014	-.097	+.609	+.614	+.560	

$$r_{2.3456} = .554139.$$

	1	2	3	4	5	
1—Weights.....						
2—Recovery.....						
3—Negativism.....	-.490	-.300				
4—Mutism.....	+.162	-.153	+.774			
5—Ster. of attitudes.....	+.105	-.097	+.614	+.609		

$$r_{2.345} = .334707.$$

depressed patients and depressions tend to recovery, this symptom may well be ambiguous, but the most interesting point brought out by the table is the fact that negativism alone of the four symptoms in the group is the one which definitely contributes to non-recovery. It is solely responsible for the multiple correlation of .335, which is low indeed but nevertheless confirms the importance of negativism in any prognostic considerations.

IV. The last step in treatment of the data was the determination of the multiple correlation for those symptoms which had the

highest positive and negative correlations with recovery, regardless of any group affiliations.

The results of the positive values are given in Table VIII. Euphoria and tearfulness are the two variables most significant for recovery and they yield a multiple correlation of .667. When

TABLE VIII

Groups composed of symptoms having the highest positive correlation with recovery

	1	2	3	4	
1—Weights.....					
2—Recovery.....					
3—Euphoria.....	+ .506	+ .558			
4—Tearful.....	+ .369	+ .440	+ .141		

$$r_{2.34} = .666864.$$

	1	2	3	4	5
1—Weights.....					
2—Recovery.....					
3—Euphoria.....	+1.131	+ .558			
4—Tearful.....	— .203	+ .440	+ .141		
5—Depressed.....	+1.017	+ .316	— .535	+ .475	

$$r_{2.345} = .929059.$$

	1	2	3	4	
1—Weights.....					
2—Recovery.....					
3—Euphoria.....	+1.019	+ .558			
4—Depressed.....	+ .861	+ .316	— .535		

$$r_{2.34} = .916885.$$

depression is introduced into the set-up, however, we find our weights behaving in a peculiar manner which can be explained only by the incompatibility between simultaneous euphoria and depression. It is true that both these symptoms may be manifested by the same patient in the course of a psychosis, but our original records were based on either manic or depressed phases and never

TABLE IX

Groups composed of symptoms having the highest negative correlation with recovery

	1	2	3	4			
1—Weights.....							
2—Recovery.....							
3—Dis. in time.....	-.322	-.486					
4—Shut-in.....	-.322	-.486	+.511				

$$r_{2.34} = .559162.$$

	1	2	3	4	5		
1—Weights.....							
2—Recovery.....							
3—Dis. in time.....	-.321	-.486					
4—Shut-in.....	-.232	-.486	+.511				
5—Hypo. del.....	-.385	-.478	+.120	+.234			

$$r_{2.345} = .672895.$$

	1	2	3	4	5	6	
1—Weights.....							
2—Recovery.....							
3—Dis. in time.....	-.198	-.486					
4—Shut-in.....	-.194	-.486	+.511				
5—Hypo. del.....	-.390	-.478	+.120	+.234			
6—Reasoning.....	-.237	-.468	+.601	+.420	+.079		

$$r_{2.3456} = .698461.$$

	1	2	3	4	5	6	7
1—Weights.....							
2—Recovery.....							
3—Dis. in time.....	-.197	-.486					
4—Shut-in.....	-.209	-.486	+.511				
5—Hypo. del.....	-.389	-.478	+.120	+.234			
6—Reasoning.....	-.301	-.468	+.601	+.420	+.079		
7—Logical fal.....	+.085	-.400	+.531	+.482	+.085	+.820	

$$r_{2.34567} = .700090.$$

on a composite picture of the two. For this reason our high multiple correlation coefficients are deceptive, as the symptoms involved do not occur at the same time.

The two variables having the highest correlation with non-recovery are disorientation in time and shut-in reaction (Table IX). These have a multiple correlation of .559, but when hypochondriacal delusions is included in the group the coefficient rises to .673. The further addition of reasoning defect and logical fallacies is only negligible in its result, so we are left with the first three symptoms mentioned as those most likely to point to a permanent psychotic condition. Their prognostic value is unfavorable in almost exactly the same degree as that of euphoria and tearfulness is favorable, and the two coefficients are surpassed only by the multiple correlation of the manic group, which is clouded by its conflicting constituents. One might say that a patient who manifests cognitive defect, in addition to disorientation in time, shut-in reaction and hypochondriacal delusions, presents a very bad prognosis.

CHAPTER IV

SUMMARY AND CONCLUSIONS

An attempt was made to investigate the relationship between a number of psychotic symptoms and subsequent recovery or non-recovery, with a view to throwing light on the problem of prognosis and assisting in its solution.

The study was based on the records of several hundred patients who had been examined from three to eight years previously. Through a questionnaire and a check-up of hospital data their later condition was ascertained, and the category of recovery or non-recovery was correlated, by means of the tetrachoric technique, with the presence or absence of each of the forty symptoms already noted.

The relation of recovery to the five syndromes and super-general factor found by Moore was determined by applying his formula for the correlation of a specific with a general factor. Recovery was then made the criterion in the multiple regression equations of the five groups and also of various symptoms chosen for their high positive and negative values. The results of these calculations seem to furnish basis for the deduction of certain conclusions.

Any conclusions drawn from a single sample, however, must naturally be put forward with some restrictions. Our own sample was not large enough to split into two and get a reliable comparison, nor was it now possible to repeat the work and obtain a sample of similar magnitude. If one consults the table of inter-correlations and probable errors on page 22, he will glean some idea of the error of sampling to be expected. It will be noticed that the lower values of r scarcely exceed their probable errors and it is evident that these symptoms mean little or nothing as far as recovery or deterioration are concerned. A new set of correlations is likely to exceed or fall short of those found in the present study by the amount of probable error. The following conclusions should be considered in the light of these qualifications.

1. The correlation method apparently affords a truer picture of

the relationship between psychotic manifestations and subsequent condition than any analysis of percentage figures alone, because it takes into consideration the entire group and the relative proportions of one variable to another in both positive and negative aspects.

2. The syndrome which is most unfavorable from the point of view of prognosis is that of cognitive defect, with the deluded and hallucinated next in order followed by the catatonic. The manic group has zero value, while constitutional hereditary depression is the most hopeful syndrome and the only one positively indicating recovery.

3. The fundamental group of causes underlying *both* the manic-depressive and praecox psychoses is negatively related to recovery.

4. Defect of reasoning is the most serious symptom in the cognitive group, while defect of perception is indifferent as regards recovery.

5. The manic group is evidently composed of conflicting elements which are unfavorable in outlook as they tend towards the praecox psychoses and favorable as they tend towards the manic-depressive.

6. The symptom of anxiety, which contributes so largely to the general factor underlying the constitutional hereditary depression syndrome, is valueless as a prognostic indicator.

7. Bizarre delusions and auditory hallucinations have less significance for non-recovery than the other variables in the deluded and hallucinated group.

8. Negativism is the only symptom of the catatonic group which contributes in any real measure to an unsatisfactory outcome. Refusal of food has a varying prognostic value on account of the different motivation underlying it. Some patients do not eat because they are too sad to make the effort and others because of a delusional system.

9. Euphoria and tearfulness, when taken in conjunction, are more indicative of recovery than any other symptoms; conversely, disorientation in time, shut-in reaction and hypochondriacal delusions point most definitely to permanent unimprovement.

10. In general, it may be said that the correlations do not show any symptom, group of symptoms or psychosis to be essentially

bound up with recovery or pathognomonically associated with deterioration; therefore no matter what an individual's symptoms may be it is possible that he should recover or finally deteriorate.

It is interesting to note, however, that our figures confirm the experience of psychiatrists that recovery is positively correlated with manic-depressive insanity and negatively correlated with the various forms of dementia praecox. This is true of manic-depressive insanity even though anxiety has a negative weight in the multiple regression equation for recovery, while being of greater importance than any other symptom in the diagnosis of the disorder. The probable explanation is that anxiety is present in involutional melancholias and this type of psychosis has a tendency to deteriorate. Hence we may conclude that a depression coming on late in life and characterized by anxiety should not be regarded as favorable for recovery.

A similar condition is quite evident in the manic group. This syndrome, as pointed out by Moore, is twofold in its character: the irritable individual with tantrums is often a praecox patient, but when such a person is euphoric he belongs to the manic-depressive group with a tendency to recover. Certain other variations in the weights are due to the fact that the manic-depressive and praecox psychoses are species of one and the same genus and cannot be looked upon as independent and essentially exclusive diagnostic entities.

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